Cut nitrate runoff - apply nutrients properly

LANCASTER - A growing number of communities have been experiencing excessive levels of nitrates in their wells and other drinking water sources. Much of this is attributed to run off of excessive amounts of applied fertilizer from the planting season.

In response to this problem, Dave Maxfield, Technical Services Director for Hi-Score Plant Food Company, Lancaster, PA, manufacturer of Hi-Score liquid fertilizer, says that "fertilizer residues in water supplies are unnecessary".

He says too many farmers believe that they must broadcast high levels of nitrogen on their soil in order to grow high-yielding corn. Many times the farmer does this only because he always has in the past, or because nitrogen prices are low right now, without looking at two very important points.

- The overall balance of all plant nutrients in the soil, such as lime, potash, or trace elements. Soil testing should always be the first step to growing corn.
- Proper placement and form of fertilizer plant nutrients used at planting time.

When these two points are given proper attention, the farmer will find that he can grow high-yielding corn with less total fertilizer applied, particularly nitrogen. In addition, applying nitrogen in excess of requirements can create deficiencies of other nutrients in the corn stalk which can actually depress yields.

Excess nitrogen fertilization can also decrease yields by producing a watery, weakened stalk, susceptable to lodging, disease, and fungus infections. When the time comes to producing ears at tasseling time, the plants do not have enough vigor and energy to combat insects and disease and still fill out the ears to their full genetic potential.

According to a special report by The Fertilizer Institute in June, 1984. Fertilizer recovery by crops is far from complete. Typically, 50-70 percent of the applied nitrogen, 7 to 15 percent of applied phosphate, and 30-50 percent of applied potash are recovered by the crop". The report continues. Nitrogen is lost mainly through runoff and leaching. Phosphate (and potash), however, attaches to soil particles and is carried away when erosion occurs".

With the need to reduce planting costs because of low farm commodity prices, Maxfield has seen high yielding fields throughout the east, midwest, and south this summer where farmers following the Hi-Score program are using far less than conventional levels of fertilizer to grow corn economically, by using a highly available, balanced, liquid row fertilizer placed in the seed row and also beneath the seed.

The emphasis is on

- Correct placement of plant food,
- Development of a deeper root system that can draw nutrients from a larger soil surface volume, and
- Promoting conditions to increase bacterial activity in the soil so that nitrogen, phosphate, and potash already in the soil and plant residues can be made available to the growing plants, thereby reducing the need for additional applied fertilizer.

Greater nitrogen efficiency is obtained by knifing in 40-60 lbs. nitrogen at planting time, plus sidedressing with 40-50 lbs. nitrogen knifed in when the corn is 15-18" height, than by broadcasting 120-180 lbs. nitrogen on top of the ground at planting time. This reduces weed pressure, consequently reducing the cost for herbicides, reduces nitrogen run off into rivers and streams, and reduces nitrogen losses to the atmosphere.

To illustrate and to put nitrogen into perspective, Maxfield says that a soil with 3% organic matter only in the upper 7 inches contains about 3,000 lbs. nitrogen/Acre. Normally only 2-4% of this nitrogen becomes available during a growing season, so we have 60-120 lbs. nitrogen available for the crop. If we can create conditions so that just 5-6% of this nitrogen can become available by stimulating and promoting bacterial activity, then it is conceivable to expect a release of 150-180 lbs. nitrogen, thereby greatly reducing the required amount of additional applied nitrogen. The same principles apply to potash and phosphate fertilization.

This summer Maxfield has seen 140 bushels corn grown with 45 lbs. additional applied nitrogen, and with 160 lbs. additional applied nitrogen, planted side by side with no significant difference in yield on sandy loam soil. He has seen 160 bushels corn on ground on which no additional potash has been applied for the past seven years. These practices cannot help but save the farmer money compared to conventional practices, and also help to conserve and keep our drinking water clean.